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Mesozoic Equisetales.—One great desideratum in discussions as to the origin of existing plants is an increase in our knowledge of those of the Mesozoic. At the present time the Paleozoic flora is much better understood than that of the intervening period, which gave rise to the characteristic groups of our existing flora. A contribution by HALLE¹⁶ throws a good deal of light on the organization of the equisetum-like forms of the earlier Mesozoic (Upper Triassic and Lower Jurassic). The author describes the vegetative stems and cones of several Equisetales. He establishes a new genus, *Neocalamites*, which has the general habit of the Calamites, including the leaf whorl made up of united leaves, with the herbaceous texture of the existing equisetums. It further resembles Calamites in the fact that only every second internodal strand (or fewer) gives off a leaf trace in the region of the node, and in the fact that the internodal bundles are frequently continuous at the nodes, in contrast to the alternating condition found in Equisetum. In Equisetites the leaves are in united sheaths as in the living genus, but in some of the species described by the author the same continuous bundles, and leaf traces fewer than the internodal strands, as are found in the Paleozoic Equisetales, are described. In the smaller branches, however, the leaf strands correspond to the number of internodal strands, thus foreshadowing the condition found in the living Equisetum. Perhaps the most interesting feature of this important addition to our knowledge is the description of the cones, cone-scales, and spores of Equisetites. The two former do not differ strikingly from those of the living genus, but the spores, interestingly enough, show the absence of elaters and the presence of triradiate sculpture described for the megaspores and microspores of the Calamites. The cones are isoporous. This article connects in a very satisfactory way the organization of the Paleozoic Equisetales with that of those still living, and illustrates the important bearing of paleontological facts on any stable scheme of evolution.—F. C. JEFFREY.

Membrane of diatoms.—MANGIN presents¹⁷ an account of some extended observations on the diatoms, especially those of the plankton. His most important observations relate to the membrane. This he finds to be composed of a substance identical with pectic compounds, combined more or less intimately with silica; the siliceous skeleton thus formed is impregnated and invested with a gelatinous membrane which often hides, at least in plankton species, the characteristic ornaments. He controverts the ideas of SCHÜTT as to the growth of the membrane (through agency of an extracellular plasma), which he discusses at some length; and after describing improved methods of staining the membrane (by ruthenium red, and by an *old* solution of hematoxylin with ammonium- or ruthenium-alum, which may be aged artificially), he gives some detailed examples in the study of certain species.—C. R. B.

¹⁶ HALLE, T. G., Zur Kenntniss des mesozoischen Equisetales Schwedens. Kung. Svensk. Vetenskapsakad. Handl. **43**: No. 1. 1908.

¹⁷ MANGIN, L., Observations sur les Diatomées. Ann. Sci. Nat. Bot. IX. **8**:117-219. figs. 14. 1908.